

LARGE-SCALE HOG PRODUCTION AND PROCESSING:

CONCERNS FOR MANITOBANS

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I. INTRODUCTION

The Citizens' Hearing on Hog Production and the Environment was held in Brandon, 29-31 October 1999, to examine the environmental, economic, social, and public health aspects surrounding industrial scale hog production and processing, using the experience of other jurisdictions in North America. This hearing arose from a dissatisfaction felt by some citizens about the decision by the Government of Manitoba to grant a license to Maple Leaf Meats (MLM) for a large hog-processing plant in Brandon (which started operation in 1999) without convening any Clean Environment Commission hearings. This lack of public hearings seemed to ignore the concerns of those people who had doubts about the advisability and sustainability of large-scale hog operations in Manitoba. Subsequently, some citizens of southwest Manitoba, spearheaded by the Sierra Club Prairie Chapter and the Westman Action Coalition, decided to organize this Citizens' Hearing in an attempt to compensate for the lack of such an activity before the licenses were granted. To ensure fairness in the hearings, the organizers arranged for the hearings to be presided over by an independent Chair (Yude Henteleff) and a panel of six commissioners (Christine Common-Singh, Celia Guilford, Roderick Macdonald, W.J. Turnock, John Welsted, and Kay Wotton).

A wide range of groups and individuals were invited to make presentations, e.g., First Nations, academics, farmers, farm organizations, industry, government (municipal, provincial, federal), non-governmental organizations, and an open invitation was extended to concerned citizens. There were 29 presentations (23 scheduled and 6 non-scheduled) (Appendix A). After each presentation the floor was open for questions, first from the commissioners and then from the audience. All the proceedings were recorded and a transcript was made. In addition, many of the presenters and other individuals and groups provided copies of documents, and references to other pertinent information. Information on how to see the "Transcript" and the "References to Documents" is given in Appendix A.

The five commissioners who wrote this report based it on the transcript, and the documents and references, as well as their notes from the Citizens' Hearing. This hearing, unlike more formal hearings conducted by a governmental body, could not compel testimony. Many of the invited groups/individuals responded, but not, unfortunately, the City of Brandon or MLM, so we did not get direct information from the proponents. Other information was examined by the commissioners in preparing this

report in an attempt to provide a balanced view. Limited resources prevented us from presenting a complete analysis of the benefits and impacts of the anticipated massive increase in hog production in Manitoba. Such an analysis is needed, and we hope that our limited examination will provide the incentive for a full, formal, and public evaluation of this development.

This report has been organized into categories corresponding to major areas of concern about the hog production and processing industries. These categories are not mutually exclusive, and each should be considered as lens through which the writers view a subject area, bringing a different focus and perspective to each category.

II. CONCLUSIONS

The relationship between large-scale meat processing plants that have been established in North America during the past 20 years and their host communities have had the following characteristics:

1. The large, often multinational corporations owning these processing plants have greater power than most of the jurisdictions with whom they negotiate, and have used this power to get financial and other concessions from the community in return for bringing investment and jobs to that community.
2. Initially, during the construction and early operational phases, local unemployment decreases, commercial activity increases, sales of lower-priced homes are brisk, and there is a small demand for higher-priced homes.
3. Once a plant is in operation, demand for consumer goods and entertainment, particularly in the lower-price range, increases. Demand for low-cost rental housing exceeds supply. Revenue from commercial and residential property, and from service fees, particularly if the new plant is paying its full and reasonable share, increases.

4. The majority of the jobs are relatively low-paid, difficult and dangerous, leading to high turnover. The workforce for these jobs tend to be highly mobile, young, and often immigrants or visible minorities.
5. The processing plant uses large amounts of water and discharges liquid wastes containing coliform bacteria, disease organisms, and plant nutrients. These contaminants may be difficult to remove in standard waste-treatment plants and have caused the deterioration of waters into which they were discharged. If the plant has been excused from full service rates, the cost of operation and of any upgrading of the facility will be borne by other customers or the government; that is, ultimately, by other businesses, residents and taxpayers in general.
6. The processing plants have tended to depress the price of hogs by vertical integration into large hog-production enterprises, by dominating the market for hogs, and by buying from independent producers only by contract. Many farmers have been forced out of hog production and even out of farming.

Family farm hog production, locally owned and managed, and using little hired help, has been replaced by large-scale corporate hog production, which:

1. Injects capital and hires workers for the construction of barns and waste disposal systems.
2. Is owned and managed non-locally.
3. Hires barn workers who are often single and mobile, with little stake in the local community.
4. Purchases in bulk, within affiliated companies or from low-price sources outside the community.
5. Uses large volumes of water and produces large amounts of waste.

The establishment of a large-scale meat processing plant has had the following direct effects on communities:

1. A shortage of, and overcrowding in, rental housing.
2. Increased costs of handling social problems such as marital disputes and child abuse, and of health care and language services.

3. Increased cost of law enforcement, particularly those associated with a young, male, and mobile workforce, such as intoxication, driving offences, assault, and murder.

The establishment of large-scale hog production units in rural communities has affected the local community by:

1. Decreasing the number of family units and the number of school children.
2. Decreasing local purchasing with loss of local businesses.
3. Loss of local control.

The process for evaluating the MLM proposal for a large-scale hog-processing plant in Brandon was flawed in that:

1. The secret "Memorandum of Understanding" between the Government of Manitoba and MLF essentially removed the "go/no-go/modify" options without any public airing of the costs and benefits of the plant and the projected large increase in hog production in Manitoba.
2. The approval of the proposal followed the provisions of The Environment Act, and ignored the provisions of The Sustainable Development Act, proclaimed 1 July 1998, which committed the Government of Manitoba to consider sustainability in evaluating all proposals.
3. The staged licencing process under The Environment Act excluded consideration of the wider implications and impacts of the proposed development.
4. Requests for public hearings for the "stages" in the licencing process were denied by the Minister of the Environment, leaving an impression in some quarters that the Memorandum of Understanding had included acceptance of the proposal and an assurance that the licencing process would not delay final approval. Although information sessions were held by the proponent, these did not allow the testimony of independent experts, questioning by a panel charged with evaluating the evidence, or the introduction of information on the wider effects of the development.

III. RECOMMENDATIONS

1. Any "Memorandum of Understanding" between the proponent of a major development and the Government of Manitoba or any other public body should be a public document and should make governmental commitment to any action or subsidy be conditional on full compliance with all pertinent laws and regulations, including an evaluation of its sustainability. There should be public participation in the processes.
2. The Environment Act should be amended to reflect the requirements of The Sustainable Development Act and the findings and recommendations of the COSDI report.
3. The Sustainable Development Act should be expanded beyond its current statement of principles. The requirement that all provincial departments and agencies include the consideration of "sustainability" in all their policies and actions, and the processes through which this goal may be attained should be legislated. This legislation should reflect the need to strengthen the ability of the government to resist short-term pressures to approve in principle, or to grant "perverse subsidies" (defined by the Rio Declaration, Agenda 21, 1992, signed by the Government of Canada as any incentive that shifts any or all the full cost of an action from the proponent), and to allow full public exposure and examination before the "go, not go, or modify" decision is made.
4. The Canadian Environmental Assessment Act, currently being reviewed, should be amended to allow federal involvement in impact assessment to be "triggered" by a potential impact upon federal responsibilities, such as a threat to species under the Fisheries Act, and the protection of resources used by indigenous people, either on- or off-reserve.
5. Consultation, representation, public information sessions, etc., are useful parts of the examination and evaluation of a proposal, but should not be used as a substitute for public hearings.
6. The siting of hog barns should be considered on both the Municipal/District and the "Larger Area" level, so that decisions can be based on broader considerations of economic, social, health, cultural, and ecological impacts.
7. The Province of Manitoba should initiate a cooperative program with the municipalities and other jurisdictions to improve the technical background for making

decisions by preparing "risk maps in relation to the location of hog barns." Maps for other potentially polluting developments could also be included in such a program.

8. Large-scale corporate animal production units (particularly for hogs and chickens) should be:

- a. placed under "Workplace Health and Safety" legislation and regulation,
- b. made legally responsible for independent testing of ground and surface waters in their vicinity, and
- c. included in The Animal Care Act, as suitably amended to include animal confinement.

9. The Government of Manitoba should review recent research establishing the public health effects of hog-barn aerial emissions on human mental and physical health.

10. The Government of Manitoba should support research on the role of phosphorous in algal growth and surface water ecological processes in the Assiniboine River, Red River, and Lake Winnipeg. Licensing of developments that would increase the amount of phosphorus in this watershed should be postponed until their impact can be established.

11. The governments of Manitoba and Canada should cooperate to increase the number and frequency of tests for surface water quality and for ground water levels and quality.

IV. PUBLIC HEALTH

The Meaning of Health

Health means more than an absence of disease, as is recognized in the Constitution of the World Health Organization (WHO): "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." Governments worldwide, including the governments of Canada and Manitoba, have formally accepted this definition. It recognizes the importance of psychological and social dimensions of health as well as physical ones. In 1984, the WHO Regional Office for Europe redefined health as "the extent to which an individual or group is able, on the one hand, to realize aspirations and to satisfy needs, and on the other hand to change and cope with the environment." This emphasizes the importance of the concept of "population health," a concept which is embedded in the policies of Health Manitoba and in proposed amendments to The Public Health Act (Health Manitoba 1997).

This concept accepts that health is possible only where resources are available to meet human needs and where living and working environments are protected from pollutants, pathogens, and physical hazards. But health also includes a sense of well-being and security. Deficient living and working environments are associated with both physical and psychosocial health problems. The 1992 Report of WHO on Health and Environment has found that violence and alienation are associated not only with poor or low-paid job prospects but also with poor quality housing, deficient services, and inadequate provision for recreation, relaxation, and development.

This perspective, and the WHO definition of health, will be used in this report to be consistent with the policy directives of the governments of Manitoba and of Canada.

Determinants of Health

The maintenance and improvement of health must be at the centre of concern about environment and development (WHO 1993). Since 1991, Environment Canada and Health Canada have been developing indicators of physical environment and ecology in relation to health. All Canadian governments acknowledge that there is much more to

health than health care, and that population health strategies must address the entire range of factors that determine health (Environment Canada 1991).

Determinants of health are the pre-pathological components of health problems. The governments of Canada and Manitoba have identified and adopted several key factors which influence population health. Three of these factors are relevant to the information received by the commissioners at the public hearings and in other documents: 1. income and social status; 2. employment and working conditions; and 3. safe and clean physical environments. The cross-jurisdictional variety of scientific data and anecdotal evidence on these key determinants of health in the context of intensified corporate hog production and processing form the basis of this section. Public discussion of these factors is necessary, since government still retains its central responsibility for protecting individuals against threats to their health and environment. Health Canada has identified as a "key priority" that "currently accepted definitions of health and the known determinants of health" are "the two most important priorities" in considering health in Environmental Assessment (1997).

Income and Social Status

Large-scale corporate hog production is one of the most contentious issues to confront rural North America in recent history. The social fabric of many communities has been ripped apart by controversy between opposing views about these large-scale hog operations. Other effects include reduced quality of life, increased potential for health risks, and a displacement of independent hog farmers (Transcript. Ikerd, Dye, Stull, and Braun). Low wage jobs and the transient work forces they often create, coupled with preferential concessions granted to these corporations, have decreased the quality of life in many communities. Despite their separation by large distances, and their differing historical and cultural traditions, these communities face similar challenges - population mobility, rising rate of crime, health and social problems, and strains on infrastructure and social services (Transcript. Broadway, Stull, and Thu).

The industrial recruitment model used by the pork processing plants in North America has been shown to offer wages consistently lower than average per capita income. Historically, employee turnover in packing plants averages 100% annually and many employees are never at one plant long enough to earn the average wage and benefits or to establish community roots. The income of most workers is at, or near, levels required for one or more government assistance programs. These factors have a profound

influence on overall community health and the delivery of health care. Public health problems are on the rise (Transcript. Broadway, Ikerd, Thu, and Stull). The social costs of large-scale hog production (characterized by regional specialization and vertical integration) include increased homelessness, crime, domestic violence, and demands for social assistance (Transcript. Broadway, Stull).

If "income and social status" is an identified determinant of health according to government policy, then clearly there are significant health risks associated with large-scale hog production and there is a significant role that government must play in identification and mitigation of these risks.

Employment and Working Conditions

Processing: The coming of large hog corporations to many centres in the United States and Canada could be referred to as a "mixed blessing," in that alternative opportunities for economic expansion in some of these jurisdictions were foregone by focusing effort and incentives on bringing large-scale corporate hog operations into the area.

The positive effects were creation of new jobs in the community, an increase in population, an increase in tax base, and an increase in the number of business establishments. However, these benefits were associated with some dramatic changes and considerable "costs," some which are measurable while others cannot yet be measured because of the absence of developed methodology (Transcript. Broadway, Dye, Ikerd, Stull, and Braun).

The United States Occupational Health and Safety Administration has described meatpacking as the most dangerous industry in the United States during the 1980s and 1990s. As productivity and speed increase, injury and illness also increase (Transcript. Broadway). One in three slaughterhouse workers will be injured on the job this year (Transcript. Dye). The cost of such injury is often a public cost. Smithfield Foods, which has acquired 10 other major pork corporations in 1998 and 1999 is the largest pork producer and processor in the world. Its fine for safety violations levied under the North Dakota Occupational Health and Safety Act is the largest recorded to date.

Production: Intensification of pig farming methods has led to increased animal density in confined buildings where several air pollutants may be concentrated. Epidemiological

studies by several authors that were presented by Drs. Pip and Paton indicate that pollution inside hog confinement buildings represents a real human and animal health hazard. Significant correlation has been found between altered pulmonary function in workers and frequency of respiratory tract diseases in their pigs. "Hog dust" includes tiny particles from animals, seeds, and manure, which can act as carriers for endotoxins and pathogens. These are among the most harmful pollutants encountered in the air of pig buildings (Bongers *et al.* 1987). Endotoxins are nonliving, complex molecules which are part of the cell wall of the gram-negative bacteria and occur in manure. Exposure to high concentration of airborne endotoxins can cause acute fever and lung function alteration accompanied by respiratory complaints such as chest tightness, cough, shortness of breath, and wheezing. Long-term endotoxin exposure may lead to decreased pulmonary function and chronic bronchitis (Bongers *et al.* 1987). Ammonia is a highly water-soluble gas frequently found at high levels in confinement buildings. It is readily absorbed by distal airway mucous of humans, resulting in retention of vapours and gases in their respiratory system.

The extensive scientific literature on workers in hog confinement facilities (Transcript. Pip) demonstrates that workers in hog barns have unique occupational illnesses:

1. organic dust syndrome caused by hog dust;
2. a high rate of chronic respiratory illness (asthma, chronic bronchitis);
3. symptoms that directly correlate in intensity with the duration of exposure;
4. respiratory or liver damage occurring over time, caused by exposure to bacterial endotoxins.

Chronic respiratory disease in 25-30% of workers inside these facilities has been reported in 25 studies world wide (Transcript. Thu). Since employment and working conditions are determinants of health, it is clear that there is significant risk to human health in large swine confinement facilities (Transcript. Ikerd, Dye, Stull, Pip, Hessel, Thu, and Paton).

Safe and Clean Physical Environments: Investigators for the United States Centre for Disease Control have found contaminants related to large-scale hog production that have serious implications for human health. These include pathogens, heavy metals, antibiotic-

resistant bacteria, and parasites, all found in surrounding wells, drainage ditches, and underground water (Transcript. Dye). Both barn and meat processing waste waters are loaded with bacteria, many of which can be transmitted to humans (Transcript. Pip). Pig manure is entirely different from other mammalian manures and it ought to be regarded as a potential health hazard. It should be fermented aerobically or composted at thermophilic temperatures before being spread on the land (Transcript. Lewis, and Paton). Practices of spreading liquid manure by "broadcasting" create aerosols that can carry pathogens for miles (Transcript. Pip).

1. Pathogens: There is direct evidence that pathogens of concern to human health are surviving in manure. These pathogens are exhibiting a disturbing pattern of antibiotic resistance (Transcript. Thu). The same type of antibiotic-resistant pathogens identified in liquid manure have also been found in surface and ground water near large-scale hog operations, suggesting that they have been viably transported. Five microbial contaminants that can be a hazard to human health have been found: *E. coli*, *Enterococcus*, *Yersinia*, *Campylobacter*, and *Cryptosporidium*.

American investigators have found both *Ascaris suum* and *Melatinium coli* in intensive hog operations. The main reservoir of infection for humans by these parasites is hogs (Transcript. Pip, Lewis). One hog producer reported a personal *Melatinium* infection (Transcript. Neufeld). *Ascaris suum* is a problem in intensively-managed production systems, and the parasites can increase in such systems (Transcript. Lewis). The potential danger associated with *A. suum* can be reduced if pig manure is handled properly. Spreading it untreated on fields is not handling it properly, as parasite eggs may be preserved for months after they are ploughed under (Transcript. Pip, Lewis, and Paton).

2. Antibiotic Resistant Bacteria: Sub-therapeutic levels of antibiotics are used in the livestock industry to promote growth and reduce the cost of raising livestock. That use fosters antibiotic resistance in bacteria which can be transmitted to humans via the food supply or through the contact with livestock or manure (Transcript. Pip, Homme). Antibiotic treatment may be ineffective in persons infected by pathogenic, antibiotic-resistant bacteria, thereby jeopardizing their health. Sub-therapeutic use of antibiotics also leads to increased levels of antibiotic resistance in animal pathogens on the farm. That resistance endangers livestock since it makes an antibiotic less useful for treating animal infections. This leads to pressure for the approval for use on animals of antibiotics that are

essential for treating human diseases. Swine manure has been shown to contain residues of amoxocillin, neomycin, oxytetracycline, chlortetracycline, and penicillin "G," etc. These end up not only in waste, but also in the meat (Transcript. Pip). The use of these antibiotics on farms may compromise their effectiveness in human medicine (Centre for Science in the Public Interest). Sweden banned antibiotic use in feed in 1986 (Transcript. Homme, Pip). The extent and severity of this problem has not been extensively studied, but there is evidence that antibiotics in animal feeds produces antibiotic resistance in *Salmonella faecalis* (Transcript. Homme).

3. Air Quality, Odour, and Health: The general realization that odour policy must be based on a sound scientific odour measurement has resulted in major developments in olfactometry and its acceptance as a legitimate environmental assessment procedure (Schultz and Vanharrenveld 1996). This means policy can no longer be based on simple nuisance. Large-scale hog operations are especially susceptible to air quality problems. A mixture of gases in animal waste creates these odours. The sources of odour are the barns, manure storage units, effluent application, and carcass disposal. The four main gases produced by the large-scale hog industry are hydrogen sulphide, carbon dioxide, ammonia, and methane. Elevated levels of these gases are toxic to many higher organisms and direct exposure to them can produce symptoms from irritation to death in humans and animals (Lorimer *et al.* 1998). These gasses affect the lungs and irritate mucous membranes (Chapin *et al.* 1998).

Massive hog operations reduce air quality with odour and gaseous emissions. The effects of these emissions range from health impairment among workers and nearby residents to cumulative environmental pollution. There is evidence of serious mental stress of people who live near these operations and are repeatedly exposed to emissions. Mental stress destroys health and affects the human biological system (Transcript. Ikerd). People who are exposed to these airborne emissions also experience a series of health problems at a disproportionate rate compared to people or controls who are not (Transcript. Thu, Hessel, Wing). Noxious environmental odours can trigger symptoms "by a variety of physiological mechanisms, including exacerbation of underlying medical conditions, innate odour aversion, aversive conditioning phenomena, stress induced illness, and possible pheromonal reactions" (Shusterman 1992). Similarly, the emissions from commercial hog operations affected nearby

residents by causing tension, depression, anger, reduced vigour, and more confusion than a control group (Schiffman *et al.* 1995). In the USA, the University of Carolina's School of Public Health and the Centre for Disease Control of the National Centre for Environmental Health have both concluded that emissions from large-scale hog facilities constitute a public health concern.

Conclusions

The available information, when placed within the analytical framework of "health determinants" and "population health," demonstrates conclusively that significant public health risks are associated with large-scale hog production. The fundamental biological needs for clean air, water, and healthy soil are also compromised. Therefore, human health, as defined by the World Health Organization and the governments of Canada and Manitoba, is also clearly compromised by rapid expansion of large-scale hog operations.

Recommendations

1. Action should be taken early to address the obvious risks to human health (as defined), created by intensive hog production and processing, even if present knowledge is insufficient to fully evaluate these risks. Since three of the key determinants of health are affected by intensified hog production and processing, further expansion of these developments must be pursued with caution in the face of uncertainty concerning environmental and health implications.
2. Human health (as defined) must be incorporated into the legislated environmental assessment process. Manitoba Health must be involved at the conceptual phase of development, not after the fact.
3. Indicators and measurables of the determinants of health which are specific to pork production and processing should be developed and applied before further expansion of pork production and processing is undertaken in Manitoba. In particular, we need better comparative data to assess the results associated with large-scale operations with comparable data from other sizes and forms of hog production.

4. Governments should ensure that agricultural uses of antibiotics do not endanger public health. Current regulations that permit the sub-therapeutic use in livestock of antibiotics that are used in (or relate to those used in) human medicine should be rescinded. This use of antibiotics, which leads to the development of antibiotic resistance, should be halted as soon as possible.
5. Emissions, currently described as "odour," should be considered a "health" issue rather than a "nuisance" issue in all future policy on hog production and processing.

V. GENERAL DEMOGRAPHIC ASPECTS

The expansion of hog production and processing in recent decades has been associated with changes in the ownership and scale of operation of meat production in North America and overseas. Associated with this have been significant changes in the demographics of the communities in which such operations are situated.

Hog Production

Until about 20 years ago, most hogs were raised on family farms with little outside labour. The change to large-scale, corporate, often vertically-integrated operations, usually with units in several locations, has forced farm families out of hog production and even out of farming. The new operations are usually controlled by non-resident management, and run by hired barn workers, often with high turnover rates. In addition, these companies tend to buy feeds and other supplies in bulk, either through an affiliated company or from the cheapest supplier in a large area. This decreases local purchases, and may lead to the closing of businesses and loss of families. The net effect in rural areas is a decrease in the number of stable family units and an increase in single, mobile workers.

Processing Plants

Many jobs in meat-processing plants are rather dirty, difficult, and relatively low-paid. The workers tend to be unskilled, mobile, and young. The rate of turnover is high, and as the local work force is depleted, it is replaced by a flow of immigrants from economically-depressed areas, nationally and internationally (Transcript. Dye). These workers, added to the existing community, will change its age-composition, family structure, and ethnic composition. The smaller the community, the greater the impact.

VI. SOCIAL ASPECTS

The social issues surrounding large-scale pork production and processing are wide-ranging and important. Often, local communities and their citizens cannot control the business practices of meat-packing companies, yet they must deal with the social consequences of the industry's presence. In short, the agri-industrial meat production system that has developed in North America has been described as threatening the long-term sustainability of rural and small town communities. Although some of these effects occur in both large-scale production and processing, we will examine them separately.

Large-scale Hog Production

Traditional hog farms, which are owner-operated and involve few hired help, are quite different from the large-scale operations. These are usually corporate-owned, operated by a manager with hired help, and are often part of an integrated meat production and processing organization. The numbers of independent hog farmers displaced could be greater than the number of jobs created in new large-scale hog operations. This radical change in food production techniques has had drastic effects on rural communities in many parts of North America. These effects were described as including:

Replacement of Family Farms: In Missouri, Iowa, and other parts of North America, the appearance of corporate hog farms has tended to eliminate family farm operations. These

cannot compete with a vertically-integrated industry that artificially depresses hog prices (Transcript. Dye).

Loss of Independent Markets for Hogs: Large-scale processing plants tend to promote contract suppliers rather than an independent market. Family farmers are placed in a precarious position, contracts tend to give low returns, but there is no competitive market (Transcript. Braun).

Loss of Local Control over Decisions Affecting the Community: Most rural communities cannot compete with powerful multinational corporations. The municipalities lack technical expertise and economic resources to defend their interests against the carrot of "jobs" and the "stick" of going elsewhere. Corporate-owned factories have no roots (Transcript. Ikerd).

Hog prices have decreased as profits are moved closer to the retail end of the business (Transcript. Tait) and large hog barns purchase their supplies in bulk from non-local suppliers, thus decreasing local income.

Local strife among residents as they divide into pro- and anti- large-scale hog operations factions (Transcript. Ikerd).

Confinement of pregnant sows to gestation crates, and the treatment of animals as if they were factory machines is offensive to some people. Most of the pigs are housed inside barns in pens with concrete or slatted floors, without bedding or straw. Sows are confined to individual stalls so narrow that they cannot turn around. The sows spend their lives in an area so small that they have to eat, sleep, urinate, and defecate all in the same spot (Transcript. Burns).

Decline of public confidence in, and support for agriculture, caused by public perception of the pollution and unethical treatment of animals associated with large-scale operations (Transcript. Burns).

Pitting farmers of one country against farmers of another country. Corporations who wish to control the trade will eliminate the trade irritants when they control all the food production on both sides of the border. Farmers on each side of the border are being used to achieve a larger goal. US grain production is being used to destroy peasant farmers in southern Mexico. Canadian hog farmers destroy American hog farmers with the low dollar. The corporations are playing one against the other and destroying everybody (Transcript. Tait, Braun).

Hog factories can no longer be considered farming or agriculture, or even agribusiness. This is industry, pure and simple. We must remember that this is not a natural or inevitable evolution of agriculture. Just over a decade ago there were no factory-style swine operations anywhere in North America. This is a deliberate plan by a handful of corporations to profit from consolidation, and ultimately control the pork industry (Transcript. Dye).

One alternative to large-scale corporate hog production is now operating in Iowa, where owner/operators raise hogs according to "high husbandry standards" and market their product to a specialty market. The animals have to be farrowed, raised in pastures and/or bedded pens, and not fed meat by-products. The owner/operator must live and work on the farm and directly care for the animals (Transcript. Willis). Where such market alternatives do not exist, farmer cooperatives, with the support of the Government of Manitoba, could enhance the position of the family farm and bring a fair price to the market.

Large-scale Meat Processing

Large-scale meat processing plants have similar social impacts, whether they process hogs, cattle, chickens, or other animals. During the past 15 years, small towns in North America that have had the sudden influx of population associated with packing plants have experienced many of the same social problems experienced by western energy boomtowns during the 1970s, including increases in homelessness, crime, domestic violence, and child abuse (Transcript. Broadway).

In Canada, High River has, so far, remained relatively immune to these social changes as most of the plant's labour force resides in Calgary. In contrast, Brooks (with a beef processing plant employing over 2500 people) has experienced an increase in a variety of social problems. Many of those drawn to the town by the prospect of employment arrive penniless and need shelter. The company has responded by providing trailer units that can accommodate up to 168 single men and women. The housing is

located adjacent to the plant. It is surrounded by a chain link fence and barbed wire. Entry is through a guardhouse structure. Food is provided by a system of vouchers that workers exchange in the plant's cafeteria. Lakeside deducts the cost of rent, food, and any extra equipment the employees may have purchased from pay. This means that a worker has little to live on and is unable to save for a damage deposit for an apartment. Crimes and the cost of social assistance have increased (Dye 1999).

In the USA, three Missouri counties (Mercer, Putnam, and Sullivan) with large hog-processing plants, temporary "Aid to Needy Families" increased more than 10% between 1993 and 1996, bucking a sharp statewide decline. Unemployment is up to 1.5% higher than pre-hog levels. Between 1990 and 1996, Putnam County had the slowest growth in personal income of any county in the State. By 1997, Mercer was the 147th poorest county in America - 2963th of 3110 counties. Sullivan County's public hospital is currently facing bankruptcy, saddled with the costs of treating the packing plant's oft-injured uninsured workers. Crimes have also increased; murder (133%), assault (40%), robbery (400%), driving while intoxicated (23%), and narcotics, (25%). Domestic violence also has increased each year since reporting began in 1992 (Dye 1999). Perhaps the most disturbing statistics are about the children. All 3 counties ranked poorly in relation to other counties in infant and child deaths, child abuse, and foster placements (Transcript. Dye).

The working conditions in large-scale meat processing plants are often poor. In the USA, a large percentage of the processing industry's nationwide labour force is migrant workers with a tenuous social standing. They are often abused, overworked, and underpaid. A lawsuit, recently brought by several migrant workers, accused the Premium Standard Foods slaughterhouse of harassing injured workers, providing squalid, vermin-infested housing, and making false recruiting promises. Slaughterhouse jobs are particularly dangerous work. One in three such workers will be injured on the job this year (Dye 1999).

Seaboard's pork plant at Guymon, Oklahoma, has been associated with seven broad areas of concern: growth and turnover, housing, health, education, social services, crime, and communication. Demand for social services will accelerate, but it is unlikely that significant financial support for these services will come from Seaboard, even though its employees and their families rely heavily on these agencies' services and resources. Crime has increased, as it will do in any community with an influx of young men. Communication with non-English-speaking immigrant workers placed demands for translators in the social and justice systems (Transcript. Stull).

Communities with large scale-meat processing plants have all faced similar challenges: growth, often rapid and explosive; population mobility; dramatic increases in cultural and linguistic diversity; rising rates of crime, health, and social problems; strains on infrastructure and social services. These challenges stem from a common source: the meat and poultry processing industry and its constant hunger for workers. Communities that pursue economic development without adequately considering larger issues of community development find themselves concerned about what is happening in their communities and to the way of life they cherish. Low-wage jobs and the transient workforces they often create, coupled with corporate tax holidays, can actually decrease the quality of life in a community. Community leaders must look beyond economic development to community development, if they are to build a successful community in the coming century (Transcript. Stull).

Conclusions

1. Problems associated with large-scale processing plants include: homelessness, crime, domestic violence, child abuse, employee turnover, reduced wages, lack of adequate low-cost housing, health problems associated with high-speed worker lines, and stress on the infrastructure systems in education, social services, and communication. A major concern is that the citizens in a community have no control over the corporate business practices that ultimately lead to the above problems.
2. In addition to the goal of low input costs and high profits associated with the multi-national meat companies, these industries should have a responsibility to the communities that host its facilities. Providing jobs is not enough, especially when jobs come with significant social and economic costs. Government should do more than lure new business with tax holidays. It should make funds available to communities to meet their needs, especially those places facing rapid growth and increasing ethnic and linguistic diversity. Grants are needed for transitional and low-cost housing. Continuing funding is necessary to offset additional drains on the institutions that provide health care, public education, and law enforcement. Host communities have an obligation as well. If they want new jobs, and the added business and tax revenue that come with them, they must provide a suitable environment for the workers who will fill those jobs.
3. Animals must be raised in a humane manner. Canada should follow the lead of the UK and place a ban on gestation crates in hog operations. As well, humane treatment of animals at the processing plant is an important issue. The larger the

processing plant, the more stress both the worker and the animal experience. In Manitoba, The Animal Care Act, proclaimed 1 August 1998, exempts from the provisions of the act any animal involved in an "accepted activity" such as agriculture, slaughter, sporting events, fishing and hunting, trapping, research, teaching, etc. This act should be reviewed and amended.

4. As citizens of this country, we need to decide what kind of a country we want to live in. A healthy, vibrant, rural economy with small family farms and small, local abattoirs is good for urban Canada as well. We need to restore public confidence in the food system (currently at an all time low). We need to develop a food supply system that does not destroy community, here or in other countries. Farmers must be valued for the contribution they make to our society.

Recommendations

The Governments of Manitoba and of Canada should:

1. Recognize the importance and cultivate the strengths of **family farms**.
- 2: Promote, develop, and enforce fair, competitive, and open markets for **family farms**.
3. Dedicate budget resources to strengthen the competitive position of **family farms** in Canadian agriculture.
4. Promote and develop locally owned processing plants.
5. Promote vibrant rural communities where the primary production, such as hogs, are processed in locally-owned and environmentally sustainable plants.
6. Provide just and humane working conditions for all people engaged in production agriculture.

VII. ECONOMIC ASPECTS

Economics tries to quantify what we spend and what we receive. It is a means to discover whether the initial purposes of a project have been achieved, how much it costs, and whether the consequences were expected and are acceptable. By trying to quantify what we spend and what we receive, we are simply adding a perspective to the review. It is important to note that quantifying expenditures and receipts may involve attributions of value which vary among different people or interests. Our natural resources ought to be universally accepted as having value. This review of the economic aspects of industrial hog production and processing is rooted in the public good and in the public interest, and the value judgments are related to public more than to individual interests. It could be argued that all the information available to the commissioners spoke in some way to the consideration of economics regarding this industry. Necessarily, only some of the information presented has been selected for this section.

Private Benefit and Public Cost

The MLM plant at Brandon, as with other government-sponsored mega-projects, was developed with the costs and expected benefits to the owner clearly identified and predicted. The benefits to the public from investment, construction, and jobs can be similarly predicted. These estimates are relatively straight forward, involving few intangibles and few attributions of value that depend on qualitative judgement. However, the citizens and taxpayers in Brandon and across the Province of Manitoba also will be responsible for expenses that are difficult to quantify:

1. The capital cost of any additions to the water treatment facility in Brandon, and liability in case of downstream damage.
2. The ongoing and indefinite costs for additional social infrastructure (e.g., social and health services) that predictably will increase.
3. Expenditures to identify and correct problems associated with wastewater discharges from the plant in Brandon as well as waste, manure, and dead pigs at production facilities.
4. The opportunity cost borne by the public for loss of use and quality of the Assiniboine River, Red River, and downstream lakes caused by increased pollution, and increased risk of contamination of humans by transferred residues and parasites.

5. The decommissioning and cleanup costs for the Brandon plant and hog production facilities, excepting those covered by The Contaminated Sites Act.
6. The cost to the City of Brandon and the Province of Manitoba to monitor for compliance with the licence and for secondary environmental impacts.

These costs will accrue to the public through acceptance and licencing of the developments by the provincial government. They translate into real dollar outlays which should be assessed before the government commits itself to such proposals. If the purpose of the investment of public money and resources is to generate net benefit for the province then that purpose cannot be said to be accomplished if the costs of the consequences of the project are ignored or minimized, and these costs exceed the benefits.

A number of presenters produced in-depth reviews of the consequential public costs that have been experienced by other jurisdictions hosting these mega-projects. There is enough similarity of experience in the USA and Canada to state that these consequences can be accepted as relevant to Manitoba. The public should realize and be greatly concerned that in most cases governments have ignored or understated the public costs before committing to a proposal. In addition, although social scientists across North America have described the problems in detail, little has been done to develop methods of quantifying the costs associated with development.

Public Good Falls Through the Cracks

Assessment procedures exist in most Canadian jurisdictions to identify the consequences and public costs relating to proposed developments. However, there are significant differences among jurisdictions as to how an assessment is done and for what purpose.

The federal government, in general, takes the view that the assessment is an integral part of the decision-making process, and that purpose and consequence should be considered before irrevocable decisions are made. Unfortunately, this government has, in its legislation and practice, so restricted the circumstances under which it will apply these principles that they are often irrelevant to real life. An example of this is the MLM plant in Brandon, where the federal government expressed deep concerns about potential pollution of the Assiniboine River (letter, B. Briscoe to L. Strachan, 17 March 1998). Nevertheless, it did not initiate an assessment of the project even when specifically asked to do so by the Long Plain First Nation. The Manitoba approach starts from a different

premise, namely that the purpose of an assessment is to mitigate the consequences of the project rather than to decide whether the project should proceed.

Briefly, the federal government approach looks at pollution issues in advance while the Manitoba approach is to monitor the consequences and fix problems as they arise. In relation to the MLM plant, the Province of Manitoba, by the terms of the licence, made the City of Brandon responsible for expenses for remedial work and some liability for future problems. Each level of government steadfastly stakes out its position based upon its legislation. Meanwhile the questions that need to be answered for the public good are left untouched and the eventual costs are passed down to the citizens. Clearly, this gap in the assessment procedures avoids responsibility by both senior levels of government and will in the future cost the public dearly in resource devaluation and site cleanup. For example, millions of extra dollars are expected to be needed for remedial work to deal with ammonia and phosphates in the discharges from the Maple Leaf plant at Brandon. These problems were anticipated, but neither senior level of government dealt with them before the approvals were given for the project. Further, the Long Plain First Nation has put the federal government on notice regarding its liability for future costs because it failed to assess the project.

Sustaining Individual Producers and Rural Communities

The largest industrial producers in the USA have already moved to vertical integration of production and supply by controlling every aspect of the hog industry from conception to consumer. Profits are focused at the retail end of the business. In the USA, pressure has been put on producers to lower their costs, which eventually puts them out of business, while the consumer pays an ever increasing price at the store. If these methods are transported to Canada, we can anticipate massive changes to the sustainability of individual producers and rural communities. There are predictions and signs that this will happen. Diverse opinions about the economics of this approach to pork production, and its impacts on farmers and communities, were expressed at the hearings and in the other material available to the commissioners.

When the MLM plant at Brandon was announced in 1997 Manitoba hog producers were promised an increase in price at the farm gate when the Brandon facility opened. Has this happened? The Western Producer (6 Jan 2000:47) again makes such a claim in relation to the proposed Schneider/Smithfield plant at Winnipeg. This report, however, steps back from the previous "promise" and reflects more of a "contingent possibility." How likely is such an increase in payment to the producers? This is an important question because the experience in the USA has been to the contrary.

It is in the public interest to have independent and competent reviews of the following questions:

1. Will the producer benefit or not?
2. Will our rural communities benefit or not?
3. What are the consequences of the industrialization of farm production?
4. What serves the public interest best: individual producers or industrial producers?

Only when such a review has information and perspective from industrial producers, individual producers, processors, retailers, consumers, and the public can reasonable and balanced policies be developed. Ad hoc decision-making will surely lead us to trouble. We are aware that some predict that industrial hog production will bring great economic benefit to producers and to communities. Others equally qualified say that these economic benefits are illusory. If the latter view is more accurate, there will be substantial costs to the public as the income levels of individual producers shrink and local communities continue to erode. If the former view is more accurate, increased income will enable communities to remain strong and to handle increased costs. These are important economic questions with important social consequences. A full review of events in other jurisdictions and of current specifics is necessary before decisions are made.

The Economics of Regulation

Scientists who identified in detail the waste disposal, contamination, and pollution problems flowing from hog production stated that these problems are directly related to the size of the operation. It is clear that more pro-active regulation of industrial agriculture is required. In general, a clear distinction between industrial-scale agricultural production and individual farm producers was made in the material available to us, e.g., the regulations for disposal of wastes (Manitoba Gazette 1998; Transcript. Brown). When additional regulation of farm practices is considered, individual producers are properly concerned that their profitability will be reduced under the weight of excessive regulations. Therefore, any new regulations must be sensitive not only to the problems of large-scale waste disposal but also to the realities and costs to smaller, individual farmers.

The Future of Agriculture is Related to Economics

We cannot expect producers of agricultural goods to continue to produce if they do not receive adequate and reasonable compensation for their efforts. We are living with rapid structural changes to ideas on profitability, social services, community infrastructure and other matters, caused by the industrialization of agriculture in response to globalization of production, processing, and marketing activities. Structural changes can have both good and bad consequences. And so the question becomes: "How do we achieve a balance that provides net benefits to the communities of Manitoba, the West, and Canada?" It is essential that we plan appropriate responses in our approach to these changes. It should be possible to use public money effectively by developing agricultural policies that respond to the changing world. The following are some of the questions that could underpin the development of such policies:

1. What are the structural change factors (as distinct from the cyclical change factors) which are evident in agriculture today?
2. What are the effects of these changes?
3. How can we best adapt to meet the challenges of these changes?
4. How can we position ourselves to the best advantage now and achieve sustainability for the future, acknowledging that there are external forces?
5. What is worth saving?
6. What merits rejection?

Future Costs: Who Should Pay? Who Will Pay?

During the hearings we heard from government officials, scientists, producers, and producer groups who told us that there are many unanswered questions about industrial hog production and processing. Significant funding is being allocated to problem identification and the quest for solutions. In the future there may be significant issues of liability for damages and compensation depending on how these problems are solved. By way of analogy, governments across North America spent large sums over a period of years in supporting the tobacco industry and then more money in identifying associated health and social problems. Then, private and public litigants began to sue the tobacco companies to recover private and public health costs. Many of these claims have been successful. How long will it be before someone develops a claim for the private or public costs of pollution, remedial work, or resource depletion consequent upon a large

industrial project such as the MLM plant? Who are the parties at risk of liability? The industrial proponents? Government as partner? Government as regulator? Both industry and government should be interested in reducing their future risk of liability by improving the quality of their decision-making today. In addition, the public in Manitoba have a right to know whether any level of government has accepted or considered the costs of future remedial work and liability relative to hog production and processing projects. Government has the obligation to provide this information if it is to be seen as acting in the public interest.

Recommendations

1. The Government of Manitoba should review and change its environmental assessment procedures to do away with staged licensing. Evaluation of the whole picture is needed for large developments, including whether it is in the public interest that the proposal as a whole should proceed or not. This should be the function of a body, established through legislative mandate, to conduct such assessments.
2. The Government of Manitoba should review and change its environmental assessment procedures to require a display of the actual and contingent present and future public costs of a development. The legitimate role of government in a development is to assess the proposal in the public interest, by identifying the issues, getting the best answers to questions of fact or science, and balancing the tradeoffs for the public good.
3. Government, and thus the public, should avoid undertaking open-ended liability for pollution cleanup and decommissioning relating to industrial hog production. The consequences should follow the profit.
4. A public inquiry or commission, established by the legislature of Manitoba, should be convened as soon as possible to review and report on the future of agriculture and the purposes, methods, and consequences of the industrialization of agricultural production. These are issues of vital importance to all Manitobans and only a body with legislative authority will be able to bring before it representatives of all interests.
5. Federal and provincial officials should jointly establish a framework for the gathering of baseline data on natural resources that would be available as a foundation for future decision-making. These data should be available to the public on an ongoing basis.

6. The terms of all development agreements between government and an industry should be made public so that citizens can properly judge what has been traded for what.

VIII. ENVIRONMENTAL ASPECTS

The environment influences all human activities, which in turn have an effect on the environment; the greater the concentration of humans the greater the impact on the environment. One of the underlying themes of several presentations to the Commission was the fact that the environmental effects of small-scale hog production and processing are controllable, whereas large-scale operations produce large quantities of waste at a few locations and environmental impacts are difficult to avoid.

Hog Production

The major environmental concerns with respect to hog barns are related to their unpleasant and unhealthy aerial emissions, the production and disposal of large quantities of waste, and their large water consumption.

Emissions: The odours associated with hog barns are well known and well documented. Perception of odours depends on concentration, wind direction and speed, distance from the source, and the acuteness of an individual's sense of smell. These odours are associated with airborne particulates (hog dust) which include endotoxins. Recent research has established that physical and mental health problems are directly related to these emissions and industry and regulators need to develop and install corrective measures (Section IV; Transcript. Hessel).

Waste and Waste Disposal: The large quantities of waste produced by large-scale hog barns are difficult to dispose of without damage to the environment. Commonly, the waste is stored in lagoons and then spread on crop land. Contamination from lagoons can occur through loss of nitrogen from the surface to the atmosphere (deposited downwind in rain); through loss of nutrients from the bottom and sides to the soil and water table; by

exit from a breach of the lagoon caused by heavy rains or floods; and by the residues and contaminated soil when the lagoon is decommissioned (Transcript. Hargrove). Some spectacular, weather-related lagoon failures and severe ground- and surface-water contamination in North Carolina (Mallin 2000), and recent studies in Missouri and Virginia (Transcript. Dye.), suggest that current guidelines for lagoon construction and decommissioning do not adequately address differences in drainage, soil type, sub-surface geology, water table levels, and susceptibility to floods and other hazards.

Nutrients from manure from lagoons can be recycled only up to the agronomic requirements of the crop; beyond that they pollute surface and ground waters. When manure is dug in, pathogens may survive in the soil, particularly in cold climates. When manure is sprayed, some pathogens survive in the atmosphere and may be carried several kilometres down wind (Transcript. Pip.). Excess applications can contaminate streams by surface runoff, or ground water by percolation, especially if the water table is close to the surface.

Studies of waste disposal problems at the Prairie Science Centre in Saskatoon include the evaluation of earthen manure storage structures, and the impact on surface water quality of the spreading of slurry on cropland (Transcript. Patience).

Currently, Manitoba controls animal production through the "Livestock Manure and Mortalities Regulation" under The Environment Act (Manitoba Gazette 1998). These regulations are progressive, but they do not address phosphates or airborne pollution. They should be examined for coherence, completeness, and to reflect recent information on the effects of soil types, water table, susceptibility to natural disasters, and the problems of decommissioning lagoons. Odour complaints are handled by the Farm Practices Protection Board, which does not cover potential airborne health risks (Transcript. Brown). At issue during the hearing was whether these regulations should be regarded as "guidelines" or "rules," an indication, perhaps, of the need for clarity and certainty in their operation.

Water Consumption: Large-scale hog barns that use well water can lower water tables, affecting wells, ponds, and the vegetation in low-lying areas in the vicinity. More hog barns means increased water demand. An understanding of local water availability is imperative before each new barn is established. Water availability is one of many parameters, including aquifer protection and soil characteristics, which should be examined in municipal and regional planning.

Hog Processing

Many of the presentations and other documents were from the USA, where such plants have been established over the past 20 years. What has happened there could happen here. The principal environmental impacts were: use of large quantities of water; production and disposal of liquid and solid wastes; and emission of odours.

Water Demand: Hog processing plants are exceedingly water greedy, using from 700-1025 L per hog to process. For example, the proposed Yonyee plant at Lethbridge, processing 8000 hogs a day, may use about 8 million litres of water per day (Transcript. Bradley). The MLM plant in Brandon gets its water from the Brandon Water Treatment Plant which takes water from the Assiniboine River. The MLM facility will require about 4.5 million litres per day per shift (Collinge 1998). Initially there will be one shift but a second shift is planned for 2003/2004. The increased demand for water for the plant and for the projected population increases in Brandon will require increased treatment capacity sometime between 2002 and 2007 (City of Brandon 1999). This will reduce the volume available downstream, for domestic use, agriculture, industry, and in-stream requirements for the preservation of a healthy river - the stated aim of the Assiniboine River Management Advisory Board (Dickson 1998).

Odour: As with hog barns, odour is a problem, particularly for people living downwind of the processing plants. The MLM plant is located in the eastern part of Brandon, east of the main built up area. Fortunately for Brandon's citizens the prevailing wind at Brandon is from the west. However, during the spring (April-May) east and northeast winds occur on average 29 percent of the time (McGinn 1988).

Liquid Waste: The disposal of the large quantities of liquid waste produced by processing plants involves several steps. The liquid is processed in lagoons and then released to a nearby water body. Contamination will occur if the lagoons leak into the ground water or if the discharge water is not sufficiently clean. The MLM plant is at the western edge of the Assiniboine Delta and is underlain by porous sands and gravels. The possible contamination of ground water at the site was examined during the provincial approval process. To ensure that any leakage from the operation of the wastewater treatment facility would be detected, a ground water monitoring program was mandated (Transcript. Strachan). MLM operate a pre-treatment plant at its facility, but the wastewater treatment plant was designed and constructed by the City of Brandon. It

discharges directly through a UV disinfection unit into the Assiniboine River (Lawrence and Bernhardt 1998). Considerable discussion revolved around the issue of potential pollution of the river. A model was used to predict the results of adding discharge from the MLM facility to existing discharges from the City of Brandon, Simplot, Manitoba Hydro, and Ayerst. The model's predictions in terms of major pollutants were that the fecal coliform count, the levels of ammonia (with some concern in the mixing zone), suspended solids, and chlorides would be within Manitoba Surface Water Quality Objectives (MSWQO). The level of dissolved oxygen would be exceeded in February and March, but the objective for overall maximum dissolved oxygen would not be exceeded. An increase in the level of plant nutrients (nitrogen and phosphorous) was projected, which could exacerbate existing algae bloom problems (Transcript. Strachan). Questions about this approach and the results obtained are:

1. Did sufficient data exist to run the model, given that there was insufficient available data to justify a CEC hearing?
2. No common standard for ammonia exists, so what requirement is not being exceeded?
3. If the dissolved oxygen requirement is exceeded part of the time, it will have an adverse effect even though the overall maximum is not exceeded. This is recognized by the clause in the MLM license requiring production to cease if dissolved oxygen levels are exceeded at times of low flow (Transcript. Williamson).
4. If algae blooms are generated, the assimilative capacity of the river has already been exceeded.
5. A license was issued for the first shift at MLM with no phosphorous control, but the issue will be "revisited" before a second shift is implemented. This issue caused much discussion because high phosphorous levels encourage the growth of blue-green algae which have an adverse effect on fish and restrict uses of Assiniboine water. Prairie rivers have a high natural phosphorous content which makes it difficult to determine what is natural and what is added by human activities. As the MSWQO for phosphorous is exceeded almost 100% of the time as the Assiniboine enters Manitoba, what justification is there for adding more? However, despite the current abundance of phosphorous "we are not seeing the normal sort of algal growth that we would predict if we were in a clear flowing stream, or a lake situation" (Transcript. Williamson). Phosphorous is not covered in the MLM license because "we are not convinced that if we remove phosphorous from the effluent that it would have any effect on the Assiniboine

River" (Transcript. Williamson). The commissioners found this discussion confusing and narrow in scope.

Solid waste will be dumped in the Brandon landfill which is on permeable sand and gravels. The site has a geotextile liner to guard against ground water contamination. The site is adequate at present, and should have sufficient capacity to handle the solid waste needs of the community at least until 2007 (City of Brandon 1999). In Manitoba, landfills are regulated under The Environment Act.

Downstream Concerns: Increased use and possible increased pollution of the Assiniboine River are the main environmental issues associated with the MLM plant in Brandon. The basin has to be considered as a whole - anything that happens in Brandon can affect all downstream users and potential users of the river (Agriculture Canada 1988). These include the McCain potato processing plant at Portage la Prairie, the MLM plant in Brandon, the water supply to Portage La Prairie and the Dakota Tipi First Nation, irrigation of crops, principally in the Portage area, and the nutrient level in Lake Winnipeg. Any deterioration of water quality will require increased treatment of the Portage water supply. Also, evidence exists that crops irrigated by water containing blue-green algae have a reduced level of photosynthesis. A plan to divert water from the Assiniboine to the Rat River will be hindered if water quality deteriorates. This plan calls for water to be stored in lagoons, and, although algae growth has not been a problem in the river, it might become so in stagnant water (Transcript. Tait).

People of the Long Plain First Nation and the Dakota Plains First Nation have a long-standing interest in and dependence on the Assiniboine River - for transport, water supply, fishing and recreation (Transcript. Scribe). Even now, swimming in the river is not advised and the water cannot be drunk. The Dakota Tipi First Nation receives piped water from Portage La Prairie and the Long Plain First Nation gets water from wells close to the river. These wells are vulnerable to flooding and contamination by the Assiniboine. These First Nations insist that the MLM plant not further restrict their use of the river and hope for protection by the federal government, which has a fiduciary responsibility for them.

It is worth noting that if legal action is taken by downstream users of the Assiniboine as a result of pollution by MLM, the action would be against the City of Brandon which owns and operates the treatment plant.

Recommendations

The Government of Manitoba, which has the major responsibility in these areas, should:

1. Review recent research on the effects of hog barn emissions on human health – both physical and mental, and change legislation and regulations to reflect these results.
2. Require a description of existing ground water quality and quantity at the location of proposed new hog barns and a prediction of their impacts on these waters before any proposal is accepted.
3. Institute a policy of systematic and continuous testing of ground water levels and quality in areas surrounding existing and new major hog producing operations.
4. Institute a policy of systematic and continuous testing of surface water quality in those parts of the province in which major hog producing operations exist.
5. Commission a detailed study of the phosphorous content of the Assiniboine River to obtain a definitive statement about the connection between "background" phosphorous content, additions by the MLM plant in Brandon, and the growth of algae. This study should be completed before a second shift is started at this plant.

IX. THE EVALUATION OF THE MAPLE LEAF MEATS PROPOSAL

The Question of a Clean Environment Commission Hearing

The filing of the proposal to construct the plant (27 February 1998), the Stage 1 submission (14 April 1998) and the "Preliminary Steps" license (8 May 1998) gave rise to a petition and numerous letters for and against a Clean Environment Commission (CEC) hearing (Public Registry, File 4289.20). The primary reason given for not recommending a CEC hearing to the Minister was: "Specific river impacts are uncertain due to insufficient river information: a public hearing will not resolve this issue. The river monitoring program is underway" (Public Registry, File 4289.20). This position was supported by other factors, i.e., that Brandon would monitor for specific impacts; that initial approval would be for a single shift; that the existing water treatment plant at Portage la Prairie was adequate; that other departments would be active in disease control and worker protection; and that The Environment Act provided for staged licensing. At the Citizens' Hearing a representative of Manitoba Environment stated: "-- in our view sufficient data was not available in terms of river impacts to justify a Commission hearing. Our experience with the Commission is that if we came to them with that uncertainty, all the Commission would do is adjourn the hearing until that information was available" (Transcript. Strachan).

Federal Government Involvement in the Assessment Process

The federal environmental assessment process is usually initiated if "federal money is involved, it occurs on federal land, or some federal decision-making authority is involved" (Transcript. Briscoe). Environment Canada chose involvement in the provincial assessment process in order to add its views of the impacts of the plant on the aquatic resources of the Assiniboine River. That department also said that staged assessment approval tend to compromise the intent of a proper environmental assessment before irrevocable decisions are made. However, the federal trigger which might have resulted in a full federal process was not pulled. It seems that federal financial involvement in a project is the most exercised reason for initiating the federal process (Transcript. Briscoe). Had federal money been involved, construction probably would not have started until an environmental decision was available. The provincial process, in comparison, is more likely to pursue rather than to lead the proponent's start-up.

A Missed Opportunity? Notwithstanding the probable limitations in the scope of a CEC hearing, a formal process has one major advantage over public information meetings and fora such as the Citizens' Hearing. Both the proponent and the government can be obliged to appear. They must expose the anticipated environmental consequences of an installation as well as the mitigation believed to be possible. This is done in front of the public at large and is subject to detailed questioning. In contrast, the Citizens' Hearing could not compel testimony. One consequence of this Ministerial decision was that public understanding of the project, including its wider implications for life in rural Manitoba, was considerably reduced. In setting the conditions of the operating license, the government of the day relied very heavily, if not solely, on the knowledge of its staff and their ability to evaluate the relevant research and experience. The government seemed to signal its overwhelming concern for jobs and economic gain, carefully avoiding any element of public debate which would have been tantamount to planning for the future.

Sustainable Development Considerations: The advice provided by Manitoba Environment (12 December 1997) to MLM referred to the requirement that the 10 principles and 6 fundamental guidelines of sustainable development, as listed in the publication "Towards a Sustainable Development Strategy for Manitobans," should be addressed in the process of preparing an environmental assessment (Public Registry, File 4289.20). At that time, the Manitoba Round Table on Environment and Economy, on behalf of the government, was engaged in a vigorous public dialogue on the ways in which sustainable development should be applied in the province. As well, departments such as Manitoba Natural Resources and Manitoba Agriculture were beginning to examine the orientation of their policies under the rubric of sustainable development. The assessment process in which MLM became engaged therefore took place while the implications of sustainable development were paraded as a priority consideration in the way in which government should do business. Subsequently, all departments and agencies of the Government of Manitoba were committed to using these principles and guidelines in their policies and operations by "The Sustainable Development Act," proclaimed 1 July 1998. Departmental compliance has been slow (Transcript. Strachan). Had public hearings on the MLM proposal been held using these principles and guidelines, they should have examined the long-term viability of the plant proper; the implications for agriculture in Manitoba (including socio-economic impacts); and the central environmental concern about the bio-physical capability of our environment to support the concentrated production and processing of hogs.

Would the CEC have seriously considered testimony on the farm income crisis and the future of family farms, surely a priority for a government professing concern for sustainability? Probably not. Experience indicates a courteous reception followed by the avoidance of such large questions. They are not local to the project under consideration, and not the stuff of a license to regulate the operation of the plant with regard to waste disposal and air and water quality.

Applying the Recommendations of the Consultation on Sustainable Development Implementation (COSDI):

Implementation (COSDI): Several presentations commented on the implications of factory production and processing of hogs for rural development and lifestyle. Much was cautionary, as for example the advocacy of strict regulation and inspection, careful storage and handling of manure, sensitivity of sub-soils, etc. (Transcript. Brown). Pervading much of the discussion was the question of the appropriateness of the industry to Manitoba, if it is to continue in the corporate form characterized by MLM and its supply network of hog barns. The demands of the second shift at the plant and a possible new, major facility in Winnipeg add to the urgency of addressing these questions.

In March 1997, the government launched a multi-stakeholder consultation initiative "to consider and make recommendations to government on how Manitoba can best implement the 'Sustainable Development Principles and Guidelines' into decision-making, including environmental management, licensing, land use planning, and regulatory processes." (COSDI 1999). The COSDI recommendations on "Municipal/District Plans" and "Planning at Large Area Level" are particularly pertinent, but the COSDI Report provides food for thought on many other issues. For example, it proposes that an effects assessment include the assessment and review of all the sustainability factors. We believe the government should pursue the recommendations with vigour as a framework for intensive public debate and a foundation for regulations, to bring new order to rural Manitoba and the hog industry in particular.

Recommendations

1. The recommendations of the Report of the Consultation on Sustainable Development Implementation (COSDI) should be implemented with all possible speed and its processes adopted even in the absence of confirming legislation.
2. With reference to hog production, priority should be given to sustainable development planning at the "Municipal/District" level as well as at the "Larger Area" level, so that developmental decisions, when they are made, can be based

upon the best available foundation of ecological, economic, social, cultural, and human health considerations.

3. Municipal ability to assess the suitability of the siting of hog barns could be improved if the province and municipalities cooperated in producing "risk" maps for each jurisdiction.
4. With reference to large processing plants, "effects assessment," as distinct from environmental impact assessment as set out in The Environment Act, should be adopted so that all sustainability factors can be addressed in each license.
5. Public participation in the assessment of new major developments should be the rule. In particular:
 - a. The COSDI Report's recommendations on this subject should be strengthened by legislation to assist the Minister to resist the pressures of "jobs and revenue" until there has been full, formal discussion of each development and its implications for the sustainability of the plant proper and its supply. In addition, time is needed to integrate the public's views (and to follow up the signals originating in the discussion) into a "go, not go, or modify" decision.
 - b. Consultation, representation, public information sessions, etc., are useful, but should not be substituted for formal hearings.
 - c. The Environment Act should be amended, at the earliest opportunity, to reflect the findings and recommendations of the COSDI Report.
 - d. Individuals and groups interested in the role of the federal government in impact assessment should take advantage of the opportunity to be involved in the review of The Canadian Environmental Assessment Act now in progress. In particular, the "triggering" provision related to the regulatory authority of the federal government, and the question of federal intervention in the protection of resources "off-reserve" but customarily utilized by indigenous people should be examined.

X. ACKNOWLEDGEMENTS

We sincerely thank the many people who presented information or subsequently made information available to the commissioners. The initiative and dedication of the

members of the Westman Community Action Coalition and the Sierra Club Prairie Chapter in organizing and operating the Citizens' Hearing deserve praise from all citizens of Manitoba. The skill and consideration shown by the Chair, Mr. Yude Henteleff, was a major factor in the success of the hearings. We also appreciate the advice on preparation of the report given by Mr. Nick Carter and the support provided by Dr. Kay Wotton, a Commissioner whose other duties prevented her involvement in the writing of this report. Our thanks also go to Manitoba Conservation, Manitoba Health, and Manitoba Agriculture and Food for their support in the production of this report.



APPENDIX A

**LIST OF PRESENTERS: CITIZENS' HEARING ON PORK PRODUCTION AND
THE ENVIRONMENT**

Agricultural Extension Centre, Brandon, MB

October 29-31, 1999

FRIDAY (1:00 - 5:00 p.m.; 7:00 - 10:00 p.m.)

1. **Dr. Bill Paton** (Brandon University); *The Maple Leaf Meats wastewater treatment plant*
2. **Larry Strachan** (Director of Approvals, Manitoba Conservation); *Approvals Overview -- Maple Leaf Meats*

Open Presentation. Tony Riley (Farmer, Strathclair, MB)

3. **Michael Broadway** (Northern Michigan State University); *Boom and Bust in Prairie Meatpacking Towns*
4. **Vincent Amanor-Boadu** (George Morris Centre, Guelph, ON); *Trade, Environment and Agri-Food Production: Some Sagacious Musings*

Open Presentation. Vicky Burns (Winnipeg Humane Society)

5. **Dennis Brown** (Regional Director, Eastern Interlake Region, Manitoba Conservation); *The Environment Act: Livestock Manure and Mortalities Management Regulation*
6. **Dwight Williamson** (Manager, Water Quality Management, Manitoba Conservation); *Management of Assiniboine River Water Quality*

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7. **Ron Dalmyn & Phyllis Abbe** (Winnipeg, MB); *Greed! Deceit! Justice?* (Dalmyn); *The spider at its web -- a commentary on corporate greed and vertical integration* (Abbe)
8. **Scott Dye** (Agricultural Coordinator, Sierra Club Missouri); *The Economic, Environmental and Social Impacts of Corporate Pork Production -- A Missouri Perspective*
9. **Dr. John Ikerd** (Missouri); *Ten Reasons Rural Communities Should Be Concerned About Large Scale, Corporate Hog Operations*

SATURDAY (9:00 - 12:00 p.m.; 1:30 - 6:00 p.m.)

1. **Fred Tait** (Rossendale, MB; National Farmers' Union); *Expanding Pork Production and Export -- Who Benefits?*
2. **Kendall Thu** (Northern Illinois University); *Recent findings from Environmental Health Research on Large-scale Swine Operations*

Open Presentation. **Barry Briscoe** (Environment Canada, Winnipeg, MB)

3. **Dr. Bill Hargrove** (Director, Kansas Centre for Agricultural Resources and the Environment); *Kansas Animal Waste Lagoon Water Quality Study*
4. **Dr. Patrick Hessel** (Edmonton); *Community Perceptions of Air Quality, Odours, and Health Near Intensive Livestock Operations*

Open Presentation. **Randolph Stefanson** (Farmer, R.M. of Bifrost, MB)

5. **Dr. Eva Pip** (University of Winnipeg); *The hog industry and public health*
6. **Dr. John Patience** (CEO, Prairie Swine Centre, Saskatoon, SK); *Providing research and technology transfer services to the pork industry*

Open Presentation. **David Neufeld** (Grower, Boissevain, MB)

7. **Donald Stull** (University of Kansas); *The Impact of Seaboard's Pork Plant on Guymon, Oklahoma*
8. **Paul Willis** (Iowa); *Marketing Environmentally Friendly Pigs*

SUNDAY (9:00 - 12:00 p.m.; 1:30 - 4:00 p.m.)

Open Presentation. Chief Dennis Meeches (Long Plain Band, MB)

1. **Brian Scribe** (Redstone Environmental, Saskatoon, SK); *The Assiniboine River Protection Project for the Long Plain First Nation: Traditional Land Use Related to Assiniboine River Issues*
2. **Dr. Cheryl Bradley** (Lethbridge, AB); *Environmental Concerns Regarding Large-scale Hog Production and Processing in Southern Alberta -- What We Have Learned and Where Are We Headed*
3. **Dr. Paul Lewis** (Lethbridge, AB); *Swine parasites*
4. **Dr. Paul Homme** (Granite River, MN); *Antibiotic Resistance and "Political" Science*
5. **Jim & Pam Braun** (Iowa); *A Farm-Wife's Observations of a Consolidating Industry and Social Challenges This Creates*
6. **Dr. Bill Paton** (Brandon University); *Sustainability of the hog industry*

The transcript of these hearings, and the list of reference to documents available to the commissioners are available for scrutiny at the Public Registry, Manitoba Conservation, and copies may be requested from: The Westman Community Action Coalition, Box 22021, Brandon, MB R7A 6Y9, Canada; or by e-mail <kattenbu@westman.wave.ca>.